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A Sensory-Feedback Device for Individuals with Prosthetic Legs

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Senior design project report: To research, develop, test, and document a sensory-feedback device for individuals with prosthetic legs. 4/98.

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Individuals who have lost a leg due to amputation also lose the signal created by the pressure on the bottom of the foot. This lost signal results in a hesitation when walking, especially during the period when the individual is initially becoming acclimated to the prosthesis. This project researched, developed, tested, and documented a sensory feedback device to restore that signal through an alternative path. The feedback device generates a signal proportional to the pressure created by the contact of the prosthesis with the floor. The design incorporates a four-channel electronic device capable of capturing signals from the heel and toe of both feet. The device processes, stores, and outputs these signals to the individual. During the fitting and adjusting of the prosthesis to the individual the stored data can also provide valuable gait-analysis information to the prosthetic technician. Since the objective of this device design was to provide more mobility to the user, the critical design criteria included: physical size, response time, ease of use, adequate memory storage, efficient power consumption, and adaptability to a wide-range of users.

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